ARIZONA GAME AND FISH DEPARTMENT
HERITAGE DATA MANAGEMENT SYSTEM

Invertebrate Abstract **Element Code:** IMGASC9320
Data Sensitivity: No

CLASSIFICATION, NOMENCLATURE, DESCRIPTION, RANGE

NAME: *Sonorella imitator*
COMMON NAME: Mimic Talussnail
SYNONYMS: None
FAMILY: Helminthoglyptidae

AUTHOR, PLACE OF PUBLICATION: Gregg, W.O. and W.B. Miller. 1974. Two new species of land snails from the Pinaleño Mountains, Arizona. Bulletin of the Southern California Academy of Science 73 (3): 146-151.

TYPE LOCALITY: South slope of the Pinaleño Mountains along the Swift Trail highway (State Route 366), on north side, at a point 20.7 road miles from its beginning at US Highway 191, Graham County, Arizona.

TYPE SPECIMEN: Holotype: No. 1154, Natural History Museum of Los Angeles County
Paratype: No. 12948, Geological Collection of the California Academy of Sciences
No. 2545, San Diego Natural History Museum

TAXONOMIC UNIQUENESS: The Mimic Talussnail was originally described by Greg and Miller (1974) from specimens collected from the Pinaleño Mountains, Graham County, Arizona. This species is considered valid by the Integrated Taxonomic Information System, Turgeon et al. (1998), and more recently confirmed to be genetically distinct from its congeners by Weaver *et al.* (2010).

DESCRIPTION: A land snail with globose shell with about 4.5 whorls. Shell has tan to olive tint and a chestnut-brown shoulder band which has indistinctly pallid borders. Approximately 20.0 mm (0.8 in.) in diameter. *S. imitator* has a shell that is, on average, slightly larger than that of *S. grahamensis*, though in this and all other characteristics, there is complete overlap among all of the shells of *Sonorella* species in the Pinaleño Mountains.

For helminthoglyptidae, the buccal mass is small and spheroidal. The gastric caecum and the rectal caecum are absent. The radular teeth are endocones and ectocones retained in marginal teeth but these are serrated, on quadrate or rectangular basal plates or the central and lateral teeth may be lacking endocones and ectocones but with a broad mesocone. The prolonged cuspid head on radular teeth may or may not be present. The cephalic shield is reduced, defined only by vestigial grooves. The hyponotum is absent. Inferior tentacles are present.

The eye position is at the tip of more or less elongate cephalic tentacle. The tentacular nerve is bifurcated (Barker 2001).

AIDS TO IDENTIFICATION: Location as well as physical characteristics.

ILLUSTRATIONS: Photo of shell (Hoffman, undated: P. 15)
Line drawing of reproductive tract (Hoffman, undated: P. 23)

TOTAL RANGE: Pinaleño Mountains, Graham County, Arizona. Previously believed to range from the Clark Peak area southeast to the Marijilda Canyon area, but recent genetic work reveals that the Mimic Talussnail is widespread throughout the Pinaleño Mountains, and is sympatric with all other species (except *S. christenseni*) and is the only *Sonorella* found in the lower portion of Wet Canyon (Weaver *et al.* 2010).

RANGE WITHIN ARIZONA: See "**Total Range**."

SPECIES BIOLOGY AND POPULATION TRENDS

BIOLOGY: Adapted to fairly wet conditions. Weather conditions greatly affect activity of *Sonorella*, with live talus snails only becoming active above ground during or after monsoon rains (Jontz *et al.* 2002, Weaver *et al.* 2010). Although suitable moisture conditions are likely for this snail during most summers, it spends a large part of year in estivation; it may have limited activity in some summers. Calcium carbonate from the limestone aids in shell deposition and buffers carbonic acid produced by the buildup of respiratory carbon dioxide during estivation. It is believed that most Pinaleño land snails mature in 2-3 years with a lifespan of approximately 6 years.

REPRODUCTION: Reproduction in *Sonorella* of the Pinaleño Mountains has not been studied. Hoffman believes that they are probably similar to other *Sonorella* species which are hermaphroditic. "Each *Sonorella* lays a clutch of thirty to forty eggs once or, in particularly good years, twice during each summer" (Hoffman undated). For helminthoglyptidae, embryonic brooding may or may not be present and they can be oviviparous or viviparous. The eggs are single, not embedded in a jelloid/mucoid mass. The egg capsule could be partially calcified, with calcite crystals embedded in jelly layers but not forming a distinct shell or it could be calcified forming a distinct shell. The larval development has no trochophore or veliger stages, there is direct development in the egg. The larval operculum is absent. The genital orifices in the male and female are fused or nearly so in cephalic region, near right ocular tentacle. The extrapallial sperm duct is a closed duct, free in the body cavity. The lumen of the penis is lacking of spines (Barker 2001).

FOOD HABITS: Hoffman (undated) states tha*t Sonorella* in the Pinaleño Mountains feed primarily on fungus and decaying plant matter supplemented with young green shoots when available. For helminthoglyptidae, the openings of the digestive gland lobes are more or less

adjacent, openings are intestinal. The stomach is greatly simplified, with very poorly developed musculature. The diagonal intestinal folds are absent. The intestinal valve is absent (Barker 2001).

HABITAT: As stated in the draft 2011 Conservation Agreement for Pinaleño Land Snails, "habitat for *Sonorella* and *Oreohelix* includes pine-oak and conifer forests with: (1) talus slopes (e.g., scree, natural rockslides, boulder fields); (2) streamside colluvial rock; or (3) mesic areas on hillsides with partial shade, rock, and leaf litter."

ELEVATION: 6,200-9,185 ft. (1,890-2,800 m) According to Weaver *et al*. (2010).

PLANT COMMUNITY: Hoffman (undated) states that "the plants associated with the land snails in the Pinaleño Mountains vary with elevation." He lists various plant species associated with these snails for "higher" and "lower" elevations, but does not define "higher" and "lower" by giving specific elevations or exact species of snails associated with various plant species. He does note, however, that "the species mix along Highway 666 (Swift Trail) above Ladybug Saddle, the type locality of *S. imitator* ... is *Quercus gambelii* (gambel oak), *Pinus ponderosa* (Ponderosa pine), and *Robinia neomexicana* (New Mexican locust).

POPULATION TRENDS: According to Hoffman (undated), it has been observed since 1954 that *S. imitator* is becoming more common over the range previously inhabited by *S. grahamensis.* The reasons for this are unknown at this time.

SPECIES PROTECTION AND CONSERVATION

ENDANGERED SPECIES ACT STATUS: None (USDI, FWS 1996)
[3C USDI, FWS 1991]

STATE STATUS: 1B (AGFD SWAP 2012)

OTHER STATUS: Forest Service Sensitive (USDA, FS Region 3 1999, 2013)

MANAGEMENT FACTORS: Land managed as a multiple use forest and is primarily used for recreation. The telescope complex on Mt. Graham and an increase of camping and recreational sites are not expected to impact these snails to a great extent. However, the phasing out by the Forest Service of the fire suppression policy, may have a greater impact. Because fires have been suppressed for a period of time, dead brush and decayed plant matter has built up on top of the talus slopes so that the heat of a large fire may be intense enough to kill the snails in the talus below.

PROTECTIVE MEASURES TAKEN: The USFS has ongoing fuel load evaluations and fuel reduction efforts ongoing within the Pinaleño Mountains, to reduce the risk of future catastrophic wildfires. Standards and guidelines for Forest activities that may affect USFS sensitive species are also being incorporated into the Forest Plan revision.

SUGGESTED PROJECTS: Finalize the 2011 draft multi-species conservation agreement for Pinaleño land snails, including the Mimic Talussnail. Conservation activities under that agreement include: continuing a monitoring program for land snails within the Pinaleño Mountains, conducting evaluations of fuel load conditions and fuel reductions in areas occupied and adjacent to land snails, and maintaining talus habitat and other habitat components used by Pinaleño land snails.

LAND MANAGEMENT/OWNERSHIP: USFS - Coronado National Forest.

SOURCES OF FURTHER INFORMATION

REFERENCES:

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ADDITIONAL INFORMATION:

Revised: 1992-04-23 (DBI)
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